

why – what exactly was the association with water which was clearly so important. Amongst a number of associations, watery locations may have represented liminal zones between this world and the next. The fact that swords are not found at Iron Age shrines (p. 81) must also be significant in this discussion.

The few stamped marks on Iron Age sword blades in Britain are interpreted as maker's marks; however, as Stead points out, some marks (those apparently showing the sun and moon) may have an astral significance and may have been used in religious ceremonies rather than in battle. This may well be the case for more swords as the link with battles is assumed rather than demonstrated. Apart from careful examination of context a very thorough technological examination may be of use in this respect.

This brings us to the specialist reports, by Stead's British Museum colleagues, which make up six appendices in the book. By far the biggest is Janet Lang's technological report on 12 of the swords in the corpus (Appendix 1). Few people realise just how much technological information there is locked up in iron objects. Radiography and the removal of one or two samples can shed much light on the swords' original structure and appearance. Swords can (and should) be treated as mini archaeological excavations which depend for their success on plans and sections as well as the recording and recovery of metallurgical structures.

It is therefore particularly good to see the detailed examination of 12 swords, even though they represent just 4% of the corpus; 11 were sampled for metallographic analysis, one was examined by x-ray only. There is a great deal of detailed description of the metallographic structures, all of which is accurate, except perhaps for the Vickers micro-hardness results. What is lacking is what all this detail means. In my view, for each of the swords examined the structures observed on x-ray should be presented in plan, in section and in three-dimensional reconstruction, which in turn can be used to revisit interpretations.

In the analytical section, the energy dispersive (EDX) analysis of the non-metallic inclusions is reported in great detail, but there is no corresponding detailed analysis of the metal at various points, possibly because wavelength dispersive (WDX) analysis was not available. What is needed is an elemental map of each section, or several – one for each significant element present apart from iron and carbon which are visible in the etched section and can therefore be described separately. To be fair, this was probably

not available when this work was carried out; it has become, over the past 15 years, an invaluable way of identifying concentrations of minor elements, which may lead, for instance, to exposing the position of welds that can otherwise be virtually invisible.

Finally, I would quibble over the tem carburisation: it suggests that the carbon got into the iron during the smithing rather than the smelting process. I would suggest that inhomogeneous structures are simply distorted and modified versions of the inhomogeneities present in the original smelted bloom after it was consolidated into a billet (referred to here as an ingot). I suspect, for example, that some complex and odd-looking structures, most notably Melsonby (no. 199), may in fact be a case of a relatively simple but highly inhomogeneous and quite distorted bloomery structure. Overall, more emphasis could have been placed on the x-ray study of the swords, and the style of reporting could on occasions be more dispassionate; for example '*the smith has not capitalised on the quality of the metal by quenching*' (p. 94). In fact, quenching might have ruined the blade, if, as seems likely, the structure was not homogeneous along the blade.

Despite these comments, this book is the very readable and informative end product of an immense amount of work on the part of Ian Stead. It will become the standard reference and the basis for future research in this field of Iron Age studies. I hope that this future research will continue to build on the different approaches to the study of ironwork outlined here. This is surely the only way in which this much overlooked material will ever be properly understood and set in its rightful cultural context.

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HERBERT LORENZ (†). *Chorologische Untersuchungen in dem spätkeltischen Oppidum bei Manching am Beispiel der Grabungsflächen der Jahre 1965-1967 und 1971* and HERMANN GERSDEN. *Fundstellenübersicht der Grabungsjahre 1961-1974* (Die Ausgrabungen in Manching 16, Römisch-Germanische Kommission des Deutschen Archäologischen Instituts zu Frankfurt am Main). 2 volumes: Vol. I, Text- und Tafelband, x+184 pages, 199 figures, 10 tables; Vol. II, 12 folded plans, CD-ROM with 329 pages, 258 tables. 2004. Stuttgart: Franz Steiner; 3-315-08329-4 hardback €96 both volumes.

The oppidum of Manching in the plain of the Danube north of Munich is the most thoroughly investigated

large settlement known in Celtic Europe. Fifty years of intensive research have resulted in a comprehensive series of reports, numbering 16 hefty volumes to date. A number of monographs have dealt with specific classes of material, while others have treated discrete excavation areas, complete with their assemblages.



Herbert Lorenz's *Habilitationsschrift*, submitted to the University of Bochum in 1988 and presented as 'chorological investigations' was originally intended to be part of a full report on the excavations of the southern bypass (*Südumgehung*) conducted by Franz Schubert in 1965-1971; unfortunately this never came into being. A reconstruction of the built environment by the excavator is thus missing. Further large-scale excavations have taken place since 1971, some already published (Volume 15 in the same series, and several interim reports in *Germania*). Strictly speaking, Lorenz's work represents a fragment that reflects the state of research in 1988.

The 1965-1971 excavation area consists of a band 25-30m wide and 900m long, stretching from roughly the centre of the oppidum to its outer edge. This sample provides the opportunity to identify spatially differentiated functional areas and a chronological sequence. In order to meet the high methodological standards that he set himself, Lorenz chose to concentrate on the settlement's pits. Their assemblages are illustrated in full in a set of 117 plates. The accompanying CD-ROM accommodates the catalogue, complete with lists, tables, and concordance tables.

The introductory remarks on the buildings and assemblages indicate that pits are predominant in the central area, whereas the deep, wide ditches occupy mainly the periphery. The pottery, which ended up in the pits as settlement refuse, must be considered as belonging to secondary contexts, representing a chronologically heterogeneous assemblage within a given structure.

The study of the spatial distribution of practically everything, from pottery to animal and human bones and the so-called small finds, amongst which the fibulae are naturally most important from a chronological point of view, forms the core of the volume (p. 16-103). The author attempts to order the masses of finds in time and space, and this within a methodological and statistical framework then rarely

seen. The 47 000 pottery sherds are arranged into four ceramic phases which can be synchronised with the fibulae sequence. An expansion of the settlement from the centre towards the periphery during the La Tène C2-D1 phase can thus be documented, a result that cannot have been that novel, even in 1988. The distribution of the animal bones suggests that, during the latest phases of occupation, significantly more meat was consumed in the northern part of the excavation, i.e. the centre of the settlement area, than in the southern part. Similarly the high proportion of dress components (for example fibulae) and rings in the north, and the predominance of fragments of iron and craft residue in the south lead Lorenz to propose 'a settlement structure that is differentially conceived'. More specific interpretations are not possible, due to the lack of analysis of the buildings. A comparison with areas excavated further east of the 'central area 1955-1961' appears to confirm the spatial trend observed here (p. 104-126).

The inevitable conclusion from the 'Considerations on the reconstruction of the settlement's history, structure and character' (p. 127-138) is that opportunities for interpretation are severely limited, given that the area of excavation examined here represents perhaps 1 per cent of the enclosed settlement. Finally, the concept of 'oppida' as 'town-like settlements with considerable differences' (p. 139-165) is hardly of much use. The remark that oppida could represent seats of the nobility, 'in the tradition of early Celtic *Fürstensitze*' is, however, more thought-provoking. Where could the Celtic *nobilitas* have resided and ruled, if not in the oppida?

Many of the author's conclusions regarding the potential of his archaeological material end in a sober, even depressing appraisal. This tone is justified if the work is measured against a scientific standard only. But if protohistoric archaeology is seen as a confrontation with a constantly changing historical scene and as a reflection of human experience, then new openings offer themselves, which go far beyond sherd statistics. Herbert Lorenz, who died all too young, has left us, with Volume 16, a piece of Manching's puzzle, contributing to the overall picture of the oppidum and the history of the Celts in general.

A comprehensive overview, by Hermann Gerdson, of the location of finds from the excavation campaign of 1961-1974 also features on the CD-ROM that accompanies the volume. It is the continuation of a first compilation that covered the years 1955 to 1960, which appeared in the first Manching volume

by Werner Krämer and Franz Schubert (1970). This second part provides further pieces of the puzzle. In sum, Herbert Lorenz and Hermann Gerdson's report should not just be read, but worked with.

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FIONA SEELEY & JAMES DRUMMOND-MURRAY.
Roman pottery production in the Walbrook valley: Excavations at 20-28 Moorgate, City of London, 1998-2000 (MoLAS Monograph 25). xviii+222 pages, 186 b&cw & colour illustrations, 33 tables. 2005. London: Museum of London Archaeology Service; 1-901992-55-1 paperback £28.95.

Seeley and Drummond-Murray's monograph creates a vivid impression of potters and glass workers



making a living in a muddy industrial zone beside the Walbrook (a tributary of the Thames) in an atmosphere thick with furnace smoke and the smell of waste generated by local leather workers and

butchers. The excavation was one of many rescue operations in this busy part of London whose technical difficulties are well illustrated on pages 2-3. The reason for publishing this particular site as an impressive Museum of London Archaeology Service monograph – rather than creating an archive report – was evidence for the manufacture of a considerable amount of pottery used in early Roman London, previously thought to have been brought in from well-known kilns in Hertfordshire and Middlesex (Verulamium region and Brockley Hill). Evidence of glassmaking was also found, including parts of a furnace for melting recycled cullet (p. 147-55). The whole book shows the value of integrating all illustrations and drawings into the main text. Discussion of the potters' workshop is brought to life in a painting (in colour, on p.139) that includes firewood, buildings containing shelves of pottery, a kiln, and a potter adding characteristic incised motifs to a London-ware bowl. It is set within an interpretive discussion that incorporates specialist information from technical appendices in an exemplary manner. The report is also unusual in having a comprehensive index which will lead

the curious from the word 'ritual' to a horse skull placed in an abandoned kiln and the skeleton of a lap-dog found in a well. The presentation of data and interpretation in an attractive but authoritative book, accessible to specialists and general readers, illustrates the value of good relations with MEPC and CgMs (developer and archaeological consultant) and Cazenove (occupier of the new building).

It is not surprising that Seeley's account of the kiln products observes the high national standards established for pottery reports, since these standards have been influenced by MoLAS practices. Colour photographs of cross-sections of fabrics at $\times 20$ magnification (in which mineral inclusions sparkle in delicious layer-cakes of orange and blue-grey clay) enhance the descriptions of pottery, which is illustrated by conventional 1:4 line drawings whose restrained use of linear shading brings out surface irregularities, decoration, and features such as applied handles. Every fabric is related to an established London series, indicated by a concise and largely self-explanatory alphabetic code (e.g. LOXI – London oxidised ware), but vessel forms have alphanumeric codes (e.g. 1B2 – ring-necked flagon with flared mouth) whose meaning must be sought in an appendix (p. 159-61) which also includes date-ranges for each form and fabric and a tabulated catalogue of all illustrated pottery. Throughout the book, Estimated Vessel Equivalents ('EVEs') provide an objective method for calculating the minimum number of vessels present. This method merited explanation, since it is not widely used outside Romano-British pottery studies. In essence, since the rim of a complete pot has a circumference of 100 per cent, 4 rim-sherds of a specific vessel form retaining 20 per cent, 10 per cent, 30 per cent and 40 per cent of their original circumferences add up to 100 per cent, or 1 'EVE', and therefore a minimum of 1 pot rather than 4.

Having praised Seeley and Drummond-Murray for communicating these discoveries to a general audience, it seems churlish to ask for more. However, the discussion (especially p. 144) gives the impression that potters were autonomous individuals making rational choices about kiln locations, rather than humble workers (slaves?) deployed by workshop proprietors; variations in products and kiln types may be a reflection of the employment and redeployment of workers with different skills and abilities. The authors outline mechanisms by which 'Roman' material culture became widely available: 'The lack